7th All India RPS OLMPIAD

Online & Offline Mega Event

QUESTION PAPER (PHASE – I)

CLASS - IX

ENGLISH (10)

Choose the most appropriate option:

Q1. Each of the players, along with the coach and the manager, _____to blame for the defeat.

(A) are (B) were (C) is (D) have been

Q2. By next March, he _____his PhD for exactly five years, yet he still_____for an academic job.

(A) will have completed / has been searching

(B) will complete / searched

(C) will have been completing / was searching

(D) has completed / had searched

Q3. A government in which priests rule in the name of God or a deity is called_____.

(A) Oligarchy (B) Plutocracy (C) Theocracy (D) Aristocracy

Q4. Identify the figure of speech in: "The pen wept as the ink dried in solitude."

(A) Personification & Metaphor (B) Metonymy

(C) Apostrophe (D) Allegory

Q5. Choose the sentence with the correct modal usage:

(A) She must be at the door; I can hear her voice.

(B) She can be at the door; I can hear her voice.

(C) She would be at the door; I can hear her voice.

(D) She should be at the door; I can hear her voice.

Q6. He showed me ___ honesty that I couldn't help trusting him.

(A) a few (B) such an (C) little (D) much

Q7. Choose the sentence where the idiom "a Pyrrhic victory" is correctly used:

(A) Their success in the tournament was a Pyrrhic victory, as half the team was injured.

(B) It was a Pyrrhic victory when the soldiers celebrated their win with fireworks.

(C) His Pyrrhic victory was winning the lottery and buying a mansion.

(D) She called it a Pyrrhic victory when her essay was published in the magazine.

Q8. Not until the judge ___ silence in the courtroom ___ the witness begin to speak.

(A) had restored / did (B) restored / did

(C) has restored / did (D) restores / did

Q9. Identify the device in: "History is a vast early warning system." – Norman Cousins

(A) Metaphor (B) Simile (C) Irony (D) Synecdoche

Q10. Which sentence correctly uses both the idiom and the modal?

(A) You must bite the bullet and face the exam, though you don't prepare.

(B) She might bite the bullet and accept the transfer, though reluctantly.

(C) He could bite the bullet and escape from the punishment easily.

(D) They should bite the bullet and avoid the problem altogether.

MATHEMATICS (20)

Q11. Find the sum of the divisors of 840.

(A) 2750 (B) 2880 (C) 2850 (D) 2800

Q12. If $a = \frac{2+\sqrt{3}}{2-\sqrt{3}}$, $b = \frac{2-\sqrt{3}}{2+\sqrt{3}}$ then the value of $a + b$ is:

(A) 14 (B) -14 (C) $8\sqrt{3}$ (D) $-\sqrt{3}$

Q13. Express $0.6 + 0.\overline{7} + 0.4\overline{7}$ in the form $\frac{p}{q}$, where p, q are co-prime integers and $q \neq 0$.

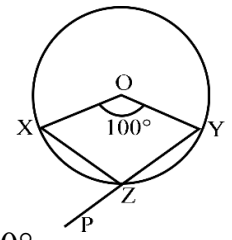
(A) $\frac{167}{90}$ (B) $\frac{171}{90}$ (C) $\frac{177}{100}$ (D) $\frac{173}{100}$

Q14. If the vertices of a triangle be $(0,0), (6,0)$ and $(6,8)$, then its incentre will be:

(A) $(1,2)$ (B) $(2,1)$ (C) $(4,2)$ (D) $(2,4)$

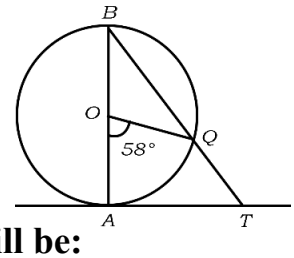
Q15. O is the centre of circle and $\angle XOY = 100°$.

Find the measure of $\angle XZP$.



(A) 50° (B) 100° (C) 150° (D) 80°

Q16. In the given figure, AB is the diameter of circle with O as centre and AT is a tangent. If $\angle AOQ = 58°$ then the value of $\angle ATQ$ is:



(A) 52° (B) 61°

(C) 46° (D) 75°

Q17. If $x^{100} + 2x^{99} + k$ is fully divisible by $(x + 1)$ then value of k will be:

(A) 7 (B) -3 (C) 2 (D) 1

Q18. If $m^2 - 4m + 1 = 0$, then the value of $\left(m^3 + \frac{1}{m^3}\right)$ is:

(A) 52 (B) 48 (C) 64 (D) 68

Q19. If $x + y + z = 0$ and $x \neq 0, y \neq 0, z \neq 0$, then the value of $\frac{x^2}{yz} + \frac{y^2}{xz} + \frac{z^2}{xy}$ is:

(A) 0 (B) 1 (C) 2 (D) 3

Q20. The area of the triangle formed by the line $y = x, x = 6$ and $y = 0$ is:

(A) 36 sq. units (B) 18 sq. units (C) 9 sq. units (D) 72 sq. units

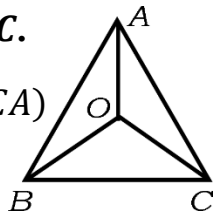
Q21. The perimeter of a triangle with vertices $(0, 4), (0, 0)$ and $(3, 0)$ is:

(A) $7 + \sqrt{5}$ (B) 6 (C) 7.5 (D) 12

Q22. AB is a diameter of a circle with centre O and CD is a chord equal to radius of the circle. AC & BD when extended intersect at E. Find $\angle AEB$

(A) 90° (B) 75° (C) 45° (D) 60°

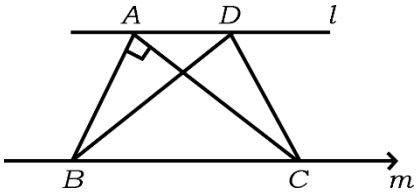
Q23. If O is any point in the interior of a triangle ABC, then $OA + OB + OC$.



(A) Equal to $AB + BC + CA$ (B) Equal to $\frac{1}{2}(AB + BC + CA)$

(C) $> \frac{1}{2}(AB + BC + CA)$ (D) None of these

Q24. In the adjoining figure, ΔABC and ΔDBC are triangles on the same base and between the parallel lines l and m. If $AB = 3cm, BC = 5cm$ and $\angle A = 90°$. Find the area of ΔDBC.



(A) 6 cm^2 (B) 9 cm^2 (C) 3 cm^2 (D) 20 cm^2

Q25. Find LCM of $\frac{4}{3}, \frac{4}{9}, \frac{2}{15}, \frac{36}{21} =$ _____

(A) 24 (B) 36 (C) 12 (D) 8

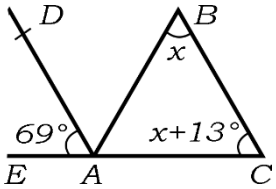
Q26. If HCF & LCM of $p(x)$ and $Q(x)$ are $(x+2)$ and $(x+3)(x^2+9x+14)$ respectively if $p(x) = x^2 + 5x + 6$, find $Q(x)$.

(A) $x^2 + 7x + 14$ (B) $x^2 + 9x + 14$ (C) $x^2 + 9x + 16$ (D) None of these

Q27. $ABCD$ is a rhombus in which altitude from D to side AB bisects AB. Find the greatest angle of rhombus.

(A) 120° (B) 60° (C) 90° (D) 110°

Q28. In the adjoining figure $\angle CAB : \angle BAD = 1 : 2$. Find the value of x.



(A) 75° (B) 65°

(C) 85° (D) 90°

Q29. If $a = \frac{2^{x-1}}{2^{x-2}}$, $b = \frac{2^{-x}}{2^{x+1}}$ and $a - b = 0$, then find the value of x.

(A) -2 (B) -1 (C) 1 (D) 2

Q30. Let $p(-2, 3)$ be a point on the graph paper. Q and R are reflection of point p in $x-axis$ and $y-axis$ respectively. Find the area of ΔPQR.

(A) 22 cm^2 (B) 12 cm^2 (C) 13 cm^2 (D) 15 cm^2

SOCIAL SCIENCE (10)

Q31. The Law of the Maximum introduced by Robespierre was related to:

(A) Limiting the power of King.

(B) Fixing maximum prices for essential goods.

(C) Setting maximum working hours.

(D) Controlling army expenditure

Q32. Which institution was the most powerful political body after the October Revolution of 1917?

(A) The Duma (B) The Soviet of workers and Soldiers Deputies.

(C) The Provisional Government (D) The Constituent Assembly

Q33. Which one of the following rivers makes a U-Turn bend near Namcha Barwa?

(A) Indus (B) Ganga (C) Brahmaputra (D) Ghaghara

Q34. The State which touches both the Tropic of Cancer and the Standard Meridian of India:

(A) Chattisgarh (B) Uttar Pradesh (C) Gujarat (D) Jharkhand

Q35. B.N Rau played an important role in making the Constitution as:

(A) Drafting Committee Chairman (B) Constitutional Advisor

(C) Leader of Adivasi (D) Leader of opposition

Q36. The Objective Resolution, which became the guiding principle of the Constitution was introduced by:

(A) B.R.Ambedkar (B) Rajendra Prasad

(C) Jawaharlal Nehru (D) Sardar Patel

Q37. If the Sun is directly overhead at the Tropic of Cancer, which season is it in India?

(A) Summer solstice (B) Winter solstice

(C) Spring equinox (D) Autumn

Q38. Which of the following laws was introduced by the revolutionary government to abolish slavery in French colonies?

(A) Constitution of 1791 (B) Law of 1794

(C) Civil code of 1804 (D) Declaration of rights of citizen

Q39. Literacy rate is an indicator of:

(A) Population growth (B) Economic activities

(C) Quality of human resources (D) National Income

Q40. Which Treaty ended Russian participation in World War 1?

(A) Treaty of Versailles (B) Treaty of Brest –Litovsk

(C) Treaty of Tilsit (D) Treaty of Paris

SCIENCE (20 Marks) Phy. + Chem. + Bio

PHYSICS (7)

Q41. Velocity of body moving along a straight line with uniform acceleration (a) reduces by 3/4 of its initial velocity in time to. The total time of motion of the body till its velocity becomes zero is:

(A) $\frac{4}{3}t_0$ (B) $\frac{3}{2}t_0$ (C) $\frac{5}{3}t_0$ (D) $\frac{8}{3}t_0$

Q42. A stone falls freely under gravity. The total distance covered by it in the last second of its journey equals the distance covered by it in first 3 seconds of its motion. The time for which the stone was in air is:

(A) 5s (B) 12s (C) 15s (D) 8s

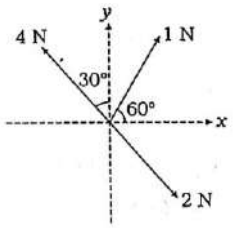
Q43. If $\vec{A} = 4\hat{i} + 3\hat{j}$ and $\vec{B} = 24\hat{i} + 7\hat{j}$, find the vector having the same magnitude as B and parallel to A.

(A) $20\hat{\imath} + 25\hat{\jmath}$ (B) $25\hat{\imath} + 20\hat{\jmath}$ (C) $15\hat{\imath} + 20\hat{\jmath}$ (D) $20\hat{\imath} + 15\hat{\jmath}$

Q44. Three forces acting on a body are shown in the figure. To have the resultant force only along the y-direction, the magnitude of the minimum additional force required is:

(A) $\frac{\sqrt{3}}{4}$ N (B) $\frac{\sqrt{3}}{2}$ N

(C) $\frac{3}{2}$ N (D) $\frac{1}{2}$ N



Q45. A bullet of mass 10 g is fired from a gun of mass 1 kg with recoil velocity of gun 5m/s. The muzzle velocity of bullet will be:

(A) 20 km/min (B) 60 km/min (C) 30 m/s (D) 500 m/s

Q46. An object of mass 5 kg fall from rest through a vertical distance of 20 m and attains a velocity of 10 m/s. How much work is done by the air resistance on the object?

(A) 750 J (B) 850 J (C) 950 J (D) 1050 J

Q47. A body of mass 5 kg is thrown vertically upward with a kinetic energy of 590 J. What will be the height at which the kinetic energy of the body becomes half of the original value? (Take g = 9.8 m/s^2).

(A) 6.02m (B) 12.01m (C) 15.04m (D) 8.02m

CHEMISTRY (7)

Q48. The number of radial nodes in 4p orbital will be:

(A) 1 (B) 2 (C) 3 (D) 4

Q49. What is the maximum number of electrons that can be associated with the following set of quantum numbers? n=4, l=2 and m=-1.

(A) 2 (B) 10 (C) 4 (D) 6

Q50. An ion having mass number 52 has 3 units positive charge. The number of neutrons in the ion exceeds the number of electrons in it by 7.The atomic number of the element is-

(A) 28 (B) 22 (C) 26 (D) 24

Q51. Delta is a place where river meets the sea. The formation of delta occurs as a result of:

(A) coagulation (B) colloid formation (C) emulsification (D) syneresis

Q52. The total pressure exerted by a number of non-reacting gases is equal to the sum of the partial pressures of the gases under similar conditions is known as :

(A) Boyle's Law (B) Charle's Law

(C) Avogadro's Law (D) Dalton's Law

Q53. Which of the following has more heat content?

(A) 10g ice at 0 degree (B) 10g of water at 0 degree

(C) both have same (D) can't say

Q54. 9.8g of H_2SO_4 is present in 2 litres of a solution. The molarity of a solution is:

(A) 0.1M (B) 0.05M (C) 0.01M (D) 0.5M

BIOLOGY (6)

Q55. Plasma membrane consists mainly of:

(A) Protein embedded in carbohydrates.

(B) Phospholipids are embedded in protein bilayer.

(C) Protein embedded in phospholipid bilayer.

(D) Protein embedded with polymer of glucose.

Q56. If the tip of sugarcane plant is removed from the field, even then it keeps on growing in length. It is due to the presence of :

(A) Cambium (B) Apical Meristem

(C) Lateral Meristem (D) Intercalary Meristem

Q57. Which of the following is a transparent tissue?

(A) Tendon (B) Hyaline cartilage (C) Fibrous cartilage (D) All of these

Q58. The presence of a specific molecule (called markers) in an organelle can be used to identify the presence of that organelle. A researcher has three test tubes with the organelles A, B, C each of which shows the presence of one marker as shown below:

Organelle	Marker	Function of the marker
A	Cytochrome oxidase	Involved in ATP synthesis
B	Ribosomal RNA	Part of ribosome
C	Acid hydrolyase	Degrades different molecules

Based on the information given in the above table. Identify the organelles A, B and C.

(A) A-Plastids, B- Rough Endoplasmic Reticulum (RER). C -Lysosomes

(B) A-Mitochondria, B- Smooth Endoplasmic Reticulum(SER)., C – Golgi Apparatus

(C) A-Plastids, B- Rough Endoplasmic Reticulum(RER).C – Golgi Apparatus

(D) A- Mitochondria, B- Rough Endoplasmic Reticulum(RER).C – Lysosomes

Q59. Functions of areolar connective tissues:

I. Joins skin to muscle

II. Fills space inside organs

III. Provides shape to body and protects soft tissues and organs

IV. Helps to repair tissues after injury

(A) I and IV

(B) I, II and III only

(C) I, II and IV only

(D) All of the above

Q60. Each of the tissues listed in the left-hand column is related to one of the words in the right hand column:

Column –I	Column –II
1. Squamous epitheium	a. Tip of nose
2. Elastic cartilage	b. Blood capillary
3. Columnar epithelum	c. Intestine
4. Granulocyte	d. Coelomic lining
5. Agranulocyte	e. Eosinophill
	f. Monocyte
	g. Platelet

(A) 1-b,d ; 2-a;3-c; 4-f;5-e

(B) 1-b,d ; 2-a;3-c; 4-e;5-f

(C) 1-b,d ; 2-c;3-a; 4-f;5-e

(D) 1-a, ; 2-b,d ;3-c; 4-f;5-e